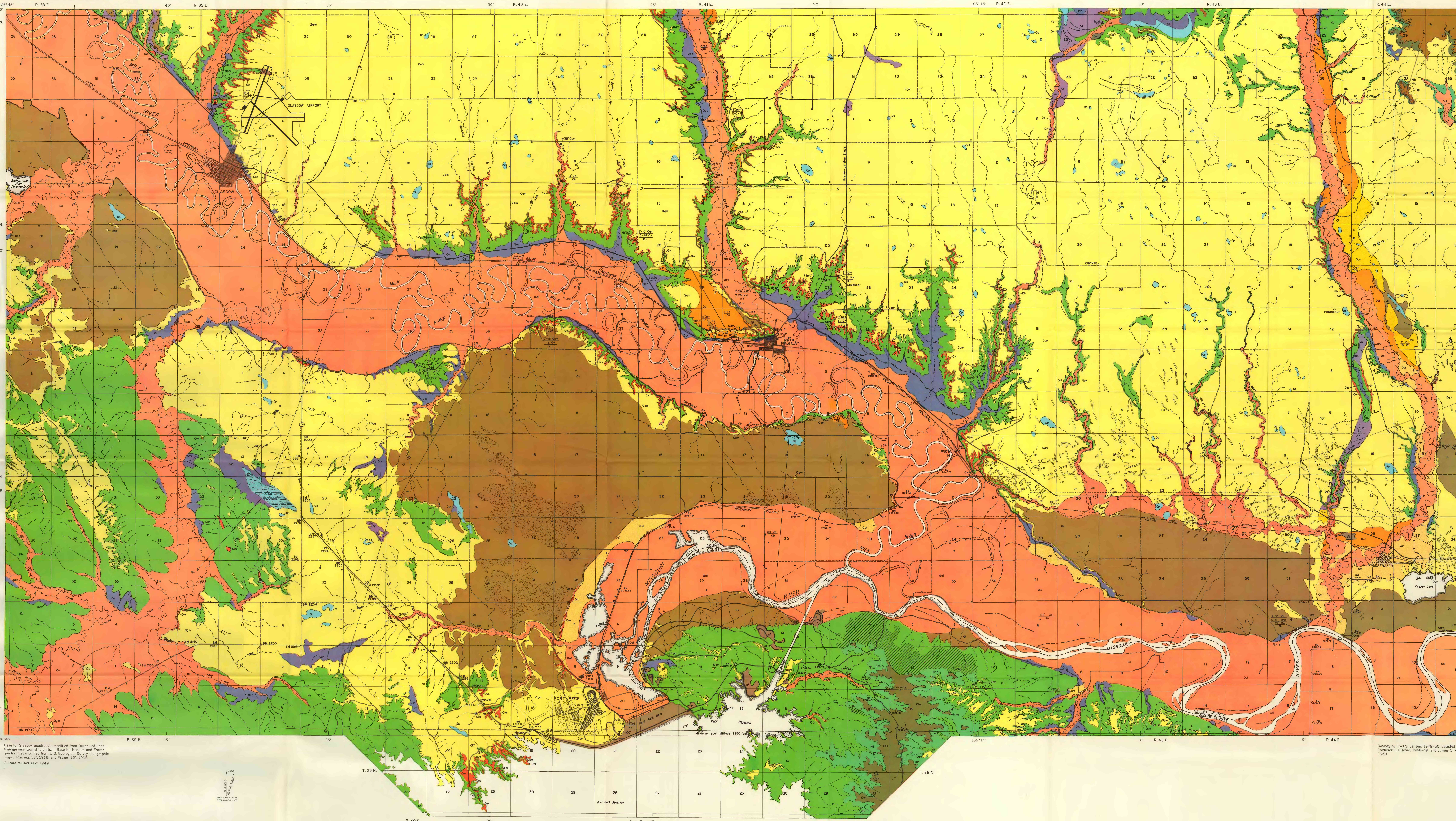
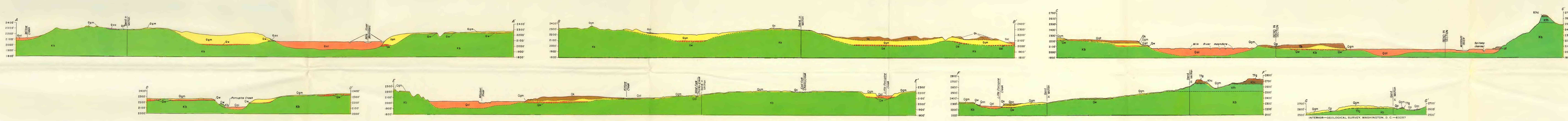
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PROFESSIONNAL PAPER 414-F
PLATE 1



Base for Glasgow quadrangle modified from Bureau of Land Management township plats. Base for Nashua and Frazer quadrangles modified from U.S. Geological Survey topographic maps: Nashua, 15', 1916, and Frazer, 15', 1915
Culture revised as of 1949

Geology by Fred S. Jensen, 1948–50, assisted by Frederick T. Fischer, 1948–49, and James O. Kistler, 1950



GEOLOGIC MAP AND SECTIONS OF THE FORT PECK AREA, MONTANA

SCALE 1:48 000
1 MILE — 3 MILES
1 KILOMETER — 3 KILOMETERS
Vertical scale of sections exaggerated
DATUM IS MEAN SEA LEVEL

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—63257

EXPLANATION

QUATERNARY

Recent

Qac — **Alluvial-colluvial deposits**
Compact, poorly sorted silty clay and minor amounts of sand and pebbles; dark grayish brown

Qp — **Intermittent pond deposits**
Plastic clay and minor amounts of silt and sand; dark gray near surface changing to light brown at depth

Qal, Qat — **Alluvium and terrace alluvium**
Qal, *interbedded clay, silt, sand, and sandy gravel; most of the sandy gravel underlies the finer sediments at depths of 50 feet or more in main valleys, 1 to 15 feet in tributaries; light to dark brown, gray and bluish gray.*
Qat, *terrace alluvium; has similar composition although coarser grained material more abundant locally; forms surfaces 10 to 15 feet above Missouri River flood plain, 5 to 15 feet along major tributaries*

Pleistocene — Wisconsin stage — Tazewell(?) substage

Qot, Qpo — **Outwash terrace deposits**
Qot, *sandy gravel enclosing a few cobbles and boulders and abundant lenses of sand and silt; light to medium brown; deposited on sloping terraces 5 to 15 feet above alluvium or terrace alluvium in Frazer quadrangle and 50 to 125 feet above in remainder of area.*
Qpo, *outwash terrace deposits marked by distinctive surface topography of irregular mounds and hollows*

Qo — **Outwash deposits**
Sandy gravel enclosing lenses of sand, locally considerable silt and clay; glacial erratic stones common; light to medium brown; floor some outwash channels

Qk — **Kintyre formation**
Clay and silty clay enclosing lenses and irregular masses of silt and very fine sand; beds thin to massive; silt and sand commonly laminated or showing small-scale crossbedding; bedding locally contorted and faulted by periglacial slumping; clay and silty clay predominantly dark brown; silt and sand predominantly tan. Dotted pattern indicates superjacent silty and clayey fine sand of unknown origin, and well-sorted dark-brown medium-grained dune sand. Hachures indicate buried till ridges

Qgm — **Ground moraine**
Till enclosing widely separated thin lenses of silt, sand, and gravel. The till is a compact unstratified mixture of clay and lesser amounts of medium-brown sand, silt, and stones. Dotted pattern indicates superjacent dark-brown silty and clayey fine sand of unknown origin. Hachure symbol represents till ridges, 3 to 8 feet high

Qw, Qws — **Wiota gravels**
Qw, *sandy quartzite gravel and fine to medium sand; locally upper part is predominantly sand with lower beds predominantly gravel enclosing minor sand lenses; in a few places entire thickness is sand, silt, and clay; east of Nashua includes scattered glacial erratics; general color reddish brown.*
Qws, *a heterogeneous facies containing no quartzite stones, composed of sediments ranging from tan sandy silt to poorly sorted reddish-brown fine gravel, derived from local Cretaceous and possibly Tertiary formations to the south or southwest. Hachures indicate till ridges*

TERTIARY

Upper Miocene or Pliocene

Tfg — **Flaxville formation**
Sandy quartzite gravels with lenses of sand and, locally, silt and clay; glacial erratics absent; generally reddish brown. Thin discontinuous patches (not mapped) of glacial drift and windblown(?) silt overlie gravel in extreme northeast of map area

CRETACEOUS

Upper Cretaceous

Khc — **Hell Creek formation**
Poorly consolidated medium-grained sandstone with thin conglomerate lenses of light-gray quartzite pebbles; discontinuously cemented to form ledges and loglike or ellipsoidal masses of hard sandstone; large-scale crossbedding common; predominantly grayish rust brown. Only the basal 50 to 60 feet of the formation present

Montana group

Kfh — **Fox Hills sandstone**
Poorly consolidated fine-grained sandstone and thin-bedded lenses of semiconsolidated silt and clay; discontinuously cemented to form ledges and ellipsoidal masses of hard sandstone; some crossbedding. Predominantly rusty brown and gray brown; transitional contact with Bearpaw

Kb — **Bearpaw shale**
Semiconsolidated clayey shale; thick units of nonfissile bentonitic shale containing clay-ironstone concretions alternate with thick units of fissile nonbentonitic shale containing limestone and other concretions; marine fossils and thin beds of bentonite are common throughout. Predominantly dark gray; some brownish-gray sandy shale near top of section

Kjr — **Judith River formation**
Gray-brown siltstone, silty and sandy shale

af — **Artificial fill**

Scarp cut by stream action

Melt-water channel floored by ground moraine

Scarp buried by ground moraine

▲ 9 Qgm / 18 Qw / Kb
Abbreviated log
Shows stratigraphic sequence and thickness, in feet, of formations. Triangle indicates site of measurement. Symbol ± means approximately; symbol > means greater than, < means less than

MF (C)
Abbreviated materials description
Sequence of letters denotes order of abundance of constituent materials, most abundant first. Letters in brackets indicate minor quantity or absence.
F, *fine sand, silt, clay (particle diameter less than 0.25 mm).*
M, *medium to coarse sand, fine to coarse gravel (particle diameter 0.25 mm to 3 inches).*
C, *cobbles, boulders (larger than 3 inches)*

▲
Site of abbreviated log or of abbreviated materials description

Contact
Dashed where approximately located; short dashed where gradational or indefinite; dotted where concealed

U D 45
Fault, showing dip
Dotted where concealed
U, *upthrown side;* D, *downthrown side*

40
Strike and dip of beds

D D
Landslide slip plane
D *indicates displaced block*

Areas affected by present-day landsliding or mantled with slump debris

✕
Sand and gravel pit

Excavation

2190 / 50
Upper number indicates approximate altitude of terrace; lower number, approximate height of terrace above flood plain